UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,404	03/01/2004	Richard Andrew Holland	120478	1472

30330 7590 05/04/2006

MCQUAIDE BLASKO
811 UNIVERSITY DRIVE
STATE COLLEGE, PA 16801

EXAMINER	
LO, SUZANNE	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/790,404	HOLLAND, RICHARD ANDREW	
	Examiner	Art Unit	
	Suzanne Lo	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03/17/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *06/09/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-8 have been presented for examination.

Information Disclosure Statement

2. The information disclosure statement filed 06/09/04 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The IDS has been considered but the article "The Practical Manual on the Monte Carlo Method for Random Walk Problems", a copy of which has not been submitted, has not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The term "substantially" in claims 1 and 2 is a relative term which renders the claims indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

4. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 7 states the method of claim 6 wherein particle transport "comprises infrared waves, optical waves, UV waves, radio waves or a combination thereof." It is unclear whether the particle transport need only comprise one of the listed waves or a plurality of the listed waves or if the particle transport need only comprise any combination of the listed waves.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1-6 are rejected** under 35 U.S.C. 102(e) as being clearly anticipated by **Caflisch et al. (U.S. Patent No. 6,714,620).**

As per claim 1, a method of algorithmically simulating the transportation of particles through a medium, comprising the steps: a) establishing a set of initial particle and environmental conditions **(column 7, lines 15-54 and column 27, lines 14-24)**; b) creating a computational grid system of voxels from a physical object or system **(column 3, lines 36-40)**; c) establishing a plurality of ray sets of particle distributions with a computational algorithm **(column 17, line 60 – column 18, lines 6)**; d) using ray sets and appropriate integration kernel to determine transport multipliers **(column 18, lines 7-16 and column 19, lines 45-57)**; e) initiating the simulated transportation of particles by applying a plurality of discrete particle distributions within voxel interaction tallies and/or upon voxel tally surfaces **(column 18, lines 17-34)**; f) applying the transport multipliers for transporting discrete particle tallies from the first plurality of voxels to a second plurality of voxels **(column 27, lines 14-24)**; g) continuing the particle tallies in voxels as the ray sets of particle distributions sequentially transport through the grid system of voxels

until a predetermined limit is attained **(column 18, lines 24-34)**; h) compiling the particle interaction tallies from within computer memory locations and applying the interaction model to determine scattering, state and accumulated interactions over a time epoch or generation **(column 10, lines 30-45)**; i) repeating steps (f-h) until interaction reaction rates and/or generational eigenvalue substantially converge **(column 28, lines 43-45 and column 38, lines 50-67)**; and j) computationally producing an output indicative of the simulated particle transport **(column 27, lines 43-47)**.

As per claim 2, a method of algorithmically simulating the transportation of particles through a medium, comprising: a) establishing a set of initial particle and environmental conditions **(column 7, lines 15-54 and column 27, lines 14-24)**; b) creating a computational grid system of voxels from a physical object or system **(column 3, lines 36-40)**; c) establishing a plurality of ray sets of particle distributions with a computational algorithm **(column 17, line 60 – column 18, lines 6)**; d) using ray sets and appropriate integration kernel to determine transport multipliers **(column 18, lines 7-16 and column 19, lines 45-57)**; e) initiating the simulated transportation of particles by applying a plurality of discrete particle distributions within voxel interaction tallies and/or upon voxel tally surfaces **(column 18, lines 17-34)**; f) applying the transport multipliers for transporting discrete particle tallies from the first plurality of voxels to a second plurality of voxels **(column 27, lines 14-24)**; g) compiling the particle interaction tallies from within computer memory locations and applying the interaction model to determine scattering, state and accumulated interactions over a time epoch or generation **(column 10, lines 30-45)**; h) repeating steps (f-h) until interaction reaction rates and/or generational eigenvalue substantially converge **(column 28, lines 43-45 and column 38, lines 50-67)**; and i) computationally producing an output indicative of the simulated particle transport **(column 27, lines 43-47)**.

As per claim 3, the method of claim 1 or 2, wherein the first voxel tally location associated with a set of multipliers is zeroed prior to undertaking step (g) **(column 26, lines 50-67)**.

As per claim 4, the method of claim 1 or 2, wherein the algorithmic computation for establishing a plurality of ray sets of particle distributions is performed using Monte Carlo techniques **(column 9, lines 30-41)**.

As per claim 5, the method of claim 1 or 2, further comprising a plurality of discrete phase space variables used to model nuclear radiation transport **(column 39, line 3-10)**.

As per claim 6, the method of claim 1 or 2, further comprising a plurality of discrete phase space variables used to model electromagnetic particle transport **(column 39, line 3-10)**.

Claims 6-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Applicants' own admission.

As per claim 6, the method of claim 1 or 2, further comprising a plurality of discrete phase space variables used to model electromagnetic particle transport **(page 2, lines 20-26)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Caflisch et al. (U.S. Patent No. 6,714,620) **in view of Llinas et al. (U.S. Patent Application Publication 2003/0144432 A1).**

As per claim 7, Caflisch is directed to the method of claim 6, but fails to disclose wherein said electromagnetic particle transport comprises infrared waves, optical waves, UV waves, radio waves or a combination thereof. Llinas teaches creating a stochastic model based on a refined Monte-Carlo approach **([0023])** and estimating particle temperatures by solving heat transfer equations **([0025])**. Caflisch and Llinas are analogous art because they are both from the same field of endeavor, particle transfer simulation. Caflisch discloses simulating the transportation of particles through a medium for nuclear radiation and electromagnetic particle transport. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the particle transfer simulation method of Caflisch with the particle transport method of radioactive heat transfer and infrared waves of Llinas in order to identify potential agglomeration mechanisms which occur during olefin polymerization **(Llinas, [0023])**.

As per claim 8, Caflisch is directed to the method of claim 1 or 2, but fails to disclose further comprising a plurality of discrete phase space variables used to model radioactive heat transfer. Llinas teaches creating a stochastic model based on a refined Monte-Carlo approach **([0023])** and estimating particle temperatures by solving heat transfer equations **([0025])**. Caflisch and Llinas are analogous art because they are both from the same field of endeavor, particle transfer simulation. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the particle transfer simulation method of Caflisch with the particle transport of radioactive heat transfer and infrared waves of Llinas in order to understand potential agglomeration mechanisms during olefin polymerization **(Llinas, [0023])**.

Conclusion

7. The prior art made of record is not relied upon because it is cumulative to the applied rejection. These references include:

1. U.S. Patent No. 6,175,761 B1 issued to Frandsen et al. on 01/16/01.

2. U.S. Patent No. 6,301,329 B1 issued to Surridge on 10/09/01.

3. U.S. Patent No. 6,029,079 issued to Cox et al. on 02/22/00.

8. All Claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne Lo whose telephone number is (571)272-5876. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2297. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Suzanne Lo
Patent Examiner
Art Unit 2128

SL
04/25/06

KAMINI SHAH
SUPERVISORY PATENT EXAMINER